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The Gender Minority Youth Study: Overview of Methods and Social Media Recruitment of a Nationwide Sample of U.S. Cisgender and Transgender Adolescents

Rachel H. Salk[1], **Brian C. Thoma**[1], **Sophia Choukas-Bradley**[2]

[1]Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA 15213, USA

[2]Department of Psychology, University of Pittsburgh, Pittsburgh, PA, USA

Abstract

Recent research has documented significant mental health disparities for transgender adolescents. However, the extant literature is hindered by vague operationalizations of gender identity and limited measurement of trans-specific stressors. In this article, we (1) introduce and describe the Gender Minority Youth (GMY) Study, a large-scale study of transgender youth disparities; and (2) provide evidence of the feasibility of using social media to recruit a diverse sample of U.S. transgender and cisgender youth. Facebook and Instagram advertisements targeted 14–18-year-old adolescents to complete an online survey. Participants (N = 3318) self-reported gender assigned at birth and current gender identity, mental health symptoms, and transgender-specific stressors and milestones. Adolescents included 1369 cisgender (n = 982 cisgender female; n = 387 cisgender male), 1938 transgender (n = 986 transgender male; n = 132 transgender female; n = 639 nonbinary assigned female at birth; n = 84 nonbinary assigned male at birth; n = 84 questioning gender identity assigned female at birth; n = 13 questioning gender identity assigned male at birth), and 11 intersex youth. The GMY Study is the first nationwide sample of U.S. adolescents recruited specifically for a study of mental health disparities between transgender and cisgender youth. We demonstrate the feasibility of using social media advertisements and a waiver of parental permission to recruit a large sample of adolescents, including subsamples of gender minority youth. We remedied limitations in the existing literature by including appropriate measures of gender assigned at birth, current gender identity, and detailed questions about transgender-specific stressors and transition milestones.

✉Rachel H. Salk, rhs32@pitt.edu.

All authors have contributed equally to this work and should be considered joint first authors.

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Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Participants provided assent prior to completing anonymous questionnaires. A waiver of parental consent was obtained for the safety of the participants.

Keywords

Adolescent; LGBT; Transgender; Gender identity; Mental health; Minority health

Introduction

In recent years, public discussions about transgender identities have increased dramatically (Goldberg, 2017), accompanied by debates within research and clinical communities regarding gender minority identities in adolescence (Wadman, 2018). Transgender or gender minority adolescents are those whose gender identity or gender expression is not aligned with the gender they were assigned at birth (American Psychological Association, 2019). Some gender minority youth identify with a binary gender identity, including adolescents identified as female at birth whose gender identity is male (transmales) and those identified male at birth whose gender identity is female (transfemales); other youth do not identify with a binary gender identity and use labels that connote a nonbinary or genderqueer identity which is not exclusively male or female (Goldberg, 2017; Golden & Oransky, 2019; Steinmetz, 2014). Nonbinary and genderqueer individuals may have gender identities which contain both masculine and feminine components (e.g., androgynous), may move between genders in a fluid way (e.g., genderfluid), or may not identify with any particular gender (e.g., agender) (Richards et al., 2016).

A growing body of research documents significant mental health disparities for transgender adolescents compared to cisgender adolescents (Connolly, Zervos, Barone, Johnson, & Joseph, 2016). Rates of self-harm and suicidality are especially high in children referred for gender dysphoria (Aitken, VanderLaan, Wasserman, Stojanovski, & Zucker, 2016; Zucker, 2019), and emerging evidence indicates rates of suicidality are high among transgender adolescents as compared to cisgender adolescents (Toomey, Syvertsen, & Shramko, 2018). Transgender youth are also at significantly greater risk of depression and anxiety (e.g., Chodzen, Hidalgo, Chen, & Garofalo, 2019), as well as for unsafe weight management behaviors (e.g., Guss, Williams, Reisner, Austin, & Katz-Wise, 2017). Although the literature is growing, new studies are needed to improve our understanding of transgender adolescent mental health. Most studies that have exclusively examined transgender adolescents have done so using small samples that are not representative of the broader transgender community; moreover, these samples preclude examination of health disparities between transgender and cisgender adolescents. Additionally, the extant disparities literature is hindered by vague operationalizations of gender identity, making it difficult to accurately identify transgender youth as well as examine rates of health outcomes within subgroups of transgender youth.

Novel large-scale studies with the specific aim of better understanding mental health among transgender youth will advance the field by asking developmentally specific questions about the unique experiences of transgender adolescents—including gender transition steps (e.g., using preferred pronouns), concerns about passing and expectations of rejection, and contact with other transgender adolescents. Results could inform prevention and intervention strategies designed to improve the mental health trajectories of transgender youth (Institute

of Medicine, 2011; Rafferty et al., 2018). However, transgender adolescents are a stigmatized and hidden population, which creates challenges for recruiting large sample sizes and maintaining the confidentiality and safety of these youth. Social media recruitment procedures may be a promising approach to safely reach and recruit a diverse sample of transgender adolescents, including those who have not yet disclosed their gender identity to others.

This article has two primary aims. First, we introduce the Gender Minority Youth (GMY) Study, describing the participants and methods in this nationwide sample of gender minority and cisgender youth. Second, we discuss how our recruitment outcomes demonstrate the feasibility of using social media to recruit a large sample of U.S. transgender and cisgender youth, with attention to diverse subgroups of gender minority adolescents.

Mental Health Among Transgender Adolescents

While research addressing transgender adolescent mental health is expanding (Leibowitz & de Vries, 2016; Zucker, 2017), it continues to be hampered by two major methodological limitations: insufficient measurement of (1) gender identity and (2) trans-specific developmental contexts.

Operationalizing Gender Identity—First, disparities research with transgender youth has been dependent upon large datasets that often do not include appropriate measures of gender identity. Large nationwide studies have the advantage of adequate sample sizes for examining disparities among this hidden and stigmatized minority group. However, the existing datasets are limited by insufficient assessments of gender assigned at birth and current gender identity, precluding the ability to accurately categorize all adolescents into gender identity groups. The Williams Institute and others recommend assessing both gender assigned at birth and current gender identity to accurately identify transgender individuals (Cahill & Makadon, 2014; Reisner et al., 2016), but the existing datasets often exclude one or both questions.

Several studies have used only one item to assess gender identity. For instance, researchers have used data from the American College Health Association–National College Health Assessment II (Diemer, Grant, Munn-Chernoff, Patterson, & Duncan, 2015; Liu, Stevens, Wong, Yasui, & Chen, 2018), which included the single gender identity question “What is your gender?” (response options: “female,” “male,” “transgender”). While this question moves beyond traditional gender response options of solely “female” and “male,” it does not allow researchers to examine subgroups of transgender adolescents, including subdivisions by gender assigned at birth. The Biennial Statewide California Student Survey has also been used to examine transgender mental health (Day, Fish, Perez-Brumer, Hatzenbuehler, & Russell, 2017; Perez-Brumer, Day, Russell, & Hatzenbuehler, 2017); a single item was used to assess both sexual orientation and gender identity: “Which of the following best describes you (Mark all that apply)?” with response options of “heterosexual (straight),” “gay, lesbian, or bisexual,” “transgender,” “not sure,” or “decline to respond.” A similar question was used in a large sample of Wisconsin youth, in which “students were asked to identify their sexual orientation or gender identity as gay, lesbian, bisexual, questioning, transgender, or ‘none of

the above'" (Robinson & Espelage, 2013, p. 1811). This assessment approach conflates sexual orientation and gender identity and could lead to inaccurate measurement of both constructs.

Some adolescent studies have expanded the assessment of gender identity, and one statewide representative study directly asked about adolescents' gender minority identity as well as sex assigned at birth: the Minnesota Student Study (Eisenberg et al., 2017; Rider, McMorris, Gower, Coleman, & Eisenberg, 2018). In this 2016 study, 9th and 11th grade participants were asked two questions: (1) biological sex ("What is your biological sex?" [male or female were the response options]); and (2) gender identity: "Do you consider yourself transgender, genderqueer, genderfluid, or unsure about your gender identity?" (yes or no). Participants who responded yes to the second question were categorized as "transgender and gender nonconforming (TGNC)" (Eisenberg et al., 2017; Rider et al., 2018). Additionally, in a nationally representative study in New Zealand, adolescents were asked about sex as well as about gender identity, with one question: "Do you think you are transgender? This is a girl who feels like she should have been a boy, or a boy who feels like he should have been a girl (e.g., Trans, Queen, Fa'fafine, Whaka-wahine, Tangata ira Tane, Genderqueer)?" (Clark et al., 2014, p. 94). Students were categorized into four groups: transgender, nontransgender, not sure, and did not understand the question. These studies took the important step of assessing both sex assigned at birth and current gender identity, thereby allowing for more accurate identification of gender minority youth and for comparisons within the transgender sample of youth who were assigned male versus female at birth. For example, within the sample of TGNC youth in the Minnesota Student Survey, those assigned female at birth were found to be significantly higher than those assigned male at birth in their reports of depressive symptoms, past-year self-harm, and lifetime suicidal ideation and attempts (Eisenberg et al., 2017). However, because multiple gender minority labels were collapsed in the question about current gender identity, it is not possible to compare subgroups of youth with different current gender identities (e.g., nonbinary or genderqueer adolescents vs. transgender adolescents who identify with a binary gender).

To summarize, the existing large-scale datasets do not provide sufficient detail to accurately categorize all gender minority youth (e.g., male-to-female adolescents vs. female-to-male adolescents). The large-scale datasets that have examined gender minority subgroup differences include participants who are predominantly over 18 years of age (James et al., 2016; Veale et al., 2015) and/or do not include a cisgender comparison group (e.g., Murchison, Agénor, Reisner, & Watson, 2019). Thus, prior research with transgender adolescents has not been able to identify the magnitude of mental health disparities of subgroups of transgender adolescents as compared to their cisgender peers. Further work comparing subgroups of gender minority youth is required to inform how future research should be prioritized.

Trans-Specific Stressors and Developmental Milestones—Second, research examining transgender adolescents' mental health has not sufficiently measured key population-specific developmental contexts, including minority stressors and gender transition progress, which could be pivotal in shaping mental health trajectories of transgender youth. Qualitative work indicates that an adolescent's gender transition is a

significant developmental process with various risk and protective factors (Schimmel-Bristow et al., 2018). Research from community samples indicates that transgender adolescents frequently experience victimization (e.g., Veale, Peter, Travers, & Saewyc, 2017), and initial evidence indicates victimization is associated with elevated rates of mental health problems among transgender youth (Clements-Nolle, Marx, & Katz, 2006; Hatchel, Valido, De Pedro, Huang, & Espelage, 2018; Veale et al., 2017). Furthermore, transgender adolescents experience internalized transphobia or shame related to their gender identity (Chodzen et al., 2019). In a small clinic sample of transgender youth assessed at their first clinical visit to a multidisciplinary gender clinic in a Midwestern U.S. city, transgender adolescents who reported high levels of internalized transphobia were more likely to meet criteria for depression and anxiety disorders (Chodzen et al., 2019). Recent research has begun to shed light on how trans-specific stressors are related to mental and behavioral health outcomes among transgender youth using nationwide online survey data of transgender youth in the U.S. (Murchison et al., 2019). It was found that transgender youth whose restroom and locker room use was restricted were more likely to experience sexual assault than youth with no restrictions. Poor peer relations may also confer risk (Wong, van der Miesen, Li, MacMullin, & VanderLaan, 2019). For example, in a study of children and adolescents seeking care at gender clinics in Toronto and Amsterdam, poor peer relations was found to be the strongest predictor of behavioral and emotional problems (de Vries, Steensma, Cohen-Kettenis, VanderLaan, & Zucker, 2016).

Gender transition milestones and interpersonal relationships may also serve as protective factors. For example, progress through specific gender transition milestones (e.g., using a chosen name, changing one’s gender presentation by dressing differently) and family support could protect against negative mental health outcomes for transgender youth. In a community cohort sample of transgender youth recruited in three U.S. cities, transgender adolescents who used a chosen name across multiple contexts had lower depressive symptoms and suicidality (Russell, Pollitt, Li, & Grossman, 2018). Additionally, research from a national community-based study of socially transitioned transgender youth, who are supported in their social transition by their parents, has revealed levels of depressive symptoms that are similar to population norms (Durwood, McLaughlin, & Olson, 2017; Olson, Durwood, DeMeules, & McLaughlin, 2016).

Although the existing research has been informative, these studies predominantly rely on samples that are not representative of the broader transgender community. Additionally, many of the extant measures of stressors and protective factors have been limited to broad constructs applicable to both transgender and cisgender youth. For example, the Minnesota Student Survey compared transgender and cisgender adolescents’ reports of protective factors, including family connectedness, teacher–student relationships, and feelings of safety in one’s community (Eisenberg et al., 2017). Researchers should prioritize future investigations that shed light on how developmentally unique stressors and protective factors are associated with mental health among larger, more inclusive samples of transgender adolescents.

Social Media Recruitment of Transgender Adolescents

Given the aforementioned limitations, it is critical to accurately and comprehensively document and describe disparities among transgender adolescents. Transgender youth are a stigmatized and hidden population, and their unique developmental context creates barriers to recruitment within many common approaches to adolescent health research (Mustanski, 2011). Many transgender adolescents and young adults have not disclosed their gender identity to their parents, and many others experience parental rejection (Grossman & D'Augelli, 2006; Mustanski, 2011; Schmitz & Tyler, 2018). These family dynamics make it extremely difficult to enroll gender minority youth into studies requiring parental permission, as involving parents could place transgender adolescents at risk of further mistreatment and victimization.

Social media recruitment is a tool to reach transgender adolescents who are at various stages in disclosing their gender identity. The vast majority of adolescents use social media platforms. Recent nationally representative statistics from the Pew Research Center indicate that 95% of teenagers have access to a smartphone, 72% report using Instagram, 51% use Facebook, and 45% go online "almost constantly" (Anderson & Jiang, 2018). Moreover, social media recruitment has been used successfully to recruit samples of sexual minority youth (e.g., Thoma, 2017).

Accordingly, the goals of this article were (1) to introduce and describe the Gender Minority Youth (GMY) Study and sample and (2) to provide evidence of the feasibility of using social media recruitment, paired with a waiver of parental consent, to recruit a large and diverse online sample of U.S. transgender and cisgender youth, including multiple subgroups of gender minority youth (e.g., transmale, transfemale, nonbinary).

Method

Participants

Participants were 14–18-year-old transgender and cisgender adolescents living in the U.S. We aimed to recruit 1000 transgender adolescents and 1000 cisgender adolescents, including gender identity subgroups large enough to complete subgroup analyses.

Procedure

Participants were recruited via advertisements on Facebook and Instagram from July to October 2018 with an advertisement budget of $1500 and a participant incentive budget of $500. Two separate advertisements were used to recruit transgender and cisgender adolescents. All ads included pictures of racially/ethnically diverse adolescents (see Supplemental Fig. 1) and targeted U.S. users aged 14–18 years. The transgender ad included additional targeting to identify users associated with "Interests" labels such as Gender Identity, Genderqueer, and Transgender Activism. No additional targeting was used for the cisgender ad.

Clicking the ad opened the survey webpage, where participants provided assent and then completed anonymous questionnaires hosted on a secure server. Within the assent form,

participants were informed that the study was voluntary, they could stop participating at any time, and they could skip any question. Participants used their own electronic device (e.g., mobile phone, tablet, computer). To ensure that study participation did not place transgender adolescents at risk of stigmatization and rejection by family members, we conducted our study with a waiver of parental permission. As an additional safety measure, participants viewed a message regarding safety and security before starting the survey (see Fig. 1). Participants who endorsed lifetime suicidality were provided with information about 24-h mental health hotlines they could contact immediately following the suicide items. All participants were provided with nationwide resources for suicidality, mental health crises, substance use, sexual assault and abuse, and eating disorders in the online informed consent and following completion of the survey. Participants who completed the survey were provided the opportunity to enter a drawing for a $50 electronic gift card (10 participants were randomly selected). The University of Pittsburgh's Human Research Protection Office approved this study.

Measures

Demographic Variables—Participants reported their age, race/ethnicity, living situation, history of homelessness, languages spoken, year in school (if applicable), zip code, receipt of free or reduced-price school meals, and subjective social status using the McArthur Scale of Subjective Social Status (Goodman et al., 2001).

Sex and Gender Identity—Participants reported their gender assigned at birth as male, female, or intersex. Participants described their gender identity from any of the following categories (participants could select multiple gender identities): male, female, transgender, female-to-male transgender/FTM, male-to-female transgender/MTF, transmale/transmasculine, transfemale/transfeminine, genderqueer, gender expansive, intersex, androgynous, nonbinary, two-spirited, third gender, agender, not sure, and other (including free text).

A seven-category gender identity variable was created, including (1) cisgender female; (2) cisgender male; (3) transgender male (including participants who reported any of the following: the combination of female gender at birth and male gender identity; female-to-male transgender/FTM; and/or transmale/transmasculine identities); (4) transgender female (including participants who reported any of the following: the combination of male gender assigned at birth and female gender identity; male-to-female transgender/MTF; and/or transfemale/transfeminine identities); (5) nonbinary assigned female at birth; (6) nonbinary assigned male at birth; and (7) questioning gender identity (including participants who selected "not sure" and no additional gender identities). Adolescents were categorized as nonbinary if they reported a genderqueer, gender expansive, intersex, androgynous, nonbinary, two-spirited, third gender, or agender current gender identity and no binary gender identities (i.e., no selection of male, female, FTM, or MTF for the gender identity question). We introduce this approach to categorization as one model of classification.

Sexual Orientation—Participants reported their sexual orientation in response to the question: "How do you identify your sexual orientation? We know you may identify with

more than one label. Please choose which one best fits how you identify." Response options included heterosexual, gay, lesbian, bisexual, queer, homosexual, pansexual, other (including free text), and I do not want to respond.

Gender Minority-Specific Measures—These measures were completed by any participant who indicated a noncisgender identity and will provide data regarding transgender-specific milestones and experiences, which have not typically been assessed in large-scale studies of transgender youth. Participants answered questions about gender transition steps (e.g., changing names, surgery), expectations of rejection, experiences of passing and being misgendered, and social contact with other transgender adolescents. Participants completed the Transgender Congruence Scale (Kozee, Tylka, & Bauerband, 2012) and the Utrecht Dysphoria Scale (Cohen-Kettenis & van Goozen, 1997).

Mental and Behavioral Health Measures—Participants reported on a range of mental and behavioral health symptoms (using validated scales), including depression, suicidality, anxiety, autism, mania, sleep, disordered eating, body dissatisfaction, self-objectification, substance use, and sexual behavior.

Other Psychosocial Measures—Participants reported on experiences of bullying, childhood trauma, and interpersonal relationships.

Results

Recruitment

Facebook and Instagram ads were served a total of 377,469 times, and 8747 clicks on the ads were recorded during recruitment (2.48% click-through rate). Our expenditures for advertisements totaled $1536. A total of 6981 participants entered the survey and began responding to survey questions (80% of those who clicked on an ad); 1339 participants who did not provide data on demographic information were removed, resulting in a sample of 5642 participants. Throughout recruitment and data collection, the data were closely monitored, and steps were taken to reach our projected recruitment numbers and to closely approximate population-level representativeness regarding race and ethnicity reported by the U.S. Census Bureau (2018): 60.4% White, 18.3% Latinx/Hispanic, 13.4% Black/African-American, 5.9% Asian-American. We also monitored the data to ensure large enough subgroups for comparison between transgender adolescents, cisgender sexual minority adolescents, and cisgender heterosexual adolescents. We purposefully oversampled cisgender sexual minority adolescents to examine whether transgender-related mental health disparities are specifically related to gender minority identity or may be partially explained by sexual minority identity. Interim analyses were only conducted on demographic variables.

We recognized early in recruitment that more adolescents identifying as female at birth (regardless of gender identity) were entering the survey. We also recognized that racial/ethnic minority groups were underrepresented among both cisgender and transgender adolescents. Thus, advertisement targeting was adjusted to oversample adolescents assigned male at birth and specific racial/ethnic groups. During recruitment, we used Facebook's targeting options to serve ads to Black, Latinx/Hispanic, and Asian-American adolescents to

ensure these groups were sufficiently represented within the sample. Recruiting transgender adolescents assigned male at birth proved especially difficult, and a screening procedure was used for the last four weeks of recruitment to recruit only these adolescents.

In total, 1997 participants were removed from the survey due to screening. When we were exclusively recruiting transgender adolescents assigned male at birth, 1958 participants were screened out. Additionally, 39 participants were screened out based on age. Although advertisements specifically targeted individuals aged 14–18, a small number of participants outside of this age range were recruited (possibly due to false information on their social media profiles).

Multiple additional steps were taken to ensure the quality of collected data. First, internet protocol addresses were used to identify potential duplicate cases. Cases with duplicate internet protocol addresses were examined by hand, with attention to demographic characteristics, height, and weight; 320 duplicate cases were removed. Collection and temporary storage of IP addresses for this purpose was approved by the Human Research Protection Office. Second, outlier analysis indicated that no cases had evidence of values outside the expected range on variables reported as counts. Third, free response text was reviewed for inappropriate responses to survey questions. Seven cases represented a pattern of inappropriate responses to survey questions (e.g., reporting “toaster” as a gender identity) and were removed. The final sample included 3318 participants.

Almost all transgender adolescents entered the survey through the transgender adolescent-specific advertisement, and cisgender adolescents who entered through the transgender adolescent-specific advertisement were more likely to identify their sexual orientation as gay/lesbian rather than heterosexual. There were no other demographic differences among cisgender participants entering through the two different advertisement sets.

Demographics

Of the 3318 total participants, 1369 identified as cisgender (n = 982 cisgender female; n = 387 cisgender male), 1938 as transgender (n = 986 transgender male; n = 132 transgender female; n = 639 nonbinary assigned female at birth; n = 84 nonbinary assigned male at birth; n = 84 questioning gender identity assigned female at birth; n = 13 questioning gender identity assigned male at birth), and 11 as intersex. Intersex participants were excluded from the gender identity subgroups because of low base rate and difficulty categorizing them as either male or female assigned at birth.

Demographic characteristics of the full sample and cisgender and transgender subgroups are shown in Table 1. Participants had an average age of 15.9 (SD 1.2; range 14–18). Participants were mostly White (65%). Most participants were in high school (84%) and spoke English primarily (94%). Most participants reported living with their parents or another family member (93%), and 10% reported a history of homelessness for at least 1 week. Zip code reports indicated that participants represented all 50 states, and Washington, DC and Puerto Rico. Cisgender adolescents were similar to nationally representative data regarding race/ethnicity (U.S. Census Bureau, 2018). Compared to cisgender adolescents, transgender adolescents were more likely to be older, $t(3118) = -2.45$, $p = .02$, Cohen’s d =

0.09, and to have lower subjective social status, $t(3019) = 9.80$, $p < .001$; Cohen's $d = 0.36$. Cisgender and transgender youth also differed in race/ethnicity, $\chi^2(7) = 49.65$, $p < .001$, Cramer's V = 0.12, sexual orientation, $\chi^2(4) = 1012.95$, $p < .001$, Cramer's V = 0.56, and education, $\chi^2(2) = 25.03$, $p < .001$, Cramer's V = 0.09; see Table 1. Transgender participants were more likely to identify as White, with minority sexual orientations, and to report they were not currently enrolled in school. In addition, half of transgender adolescents (51%) reported their parents were aware of their gender identity.

Discussion

Despite growing public discourse and scientific inquiry into the mental health of gender minority adolescents (e.g., Janssen, Busa, & Wernick, 2019; Janssen & Leibowitz, 2018; Rafferty et al., 2018; Sevlever & Meyer-Bahlburg, 2019), the research field sorely lacks a nationwide study of diverse adolescents that contains trans-inclusive measures (Abramovich & Cleverley, 2018). We have introduced the GMY Study, the first large, nationwide sample of adolescents recruited specifically for a study of mental and behavioral health disparities between transgender and cisgender youth in the U.S. We remedied limitations in the extant literature by including appropriate measures of gender assigned at birth and current gender identity, as well as detailed questions about trans-specific stressors and transition milestones. We also administered an extensive battery of measures assessing mental and behavioral health, as well as demographic variables, interpersonal relationships, and life experiences. In addition to introducing and describing the GMY Study, the second goal of this article was to demonstrate the feasibility of recruiting a large sample of U.S. transgender and cisgender adolescents through social media for an anonymous online survey with a waiver of parental permission. Using these methods, we were able to recruit a large, diverse online sample, including multiple subgroups of gender minority youth (e.g., transmale, transfemale, nonbinary). These methods are critical for obtaining a sample of transgender adolescents that is not biased by youth participation in local transgender clinics or organizations, access to resources, or outness to parents and the community about gender identity. Importantly, most participants reported feeling safe completing the survey.

Social media sampling is a powerful research recruitment tool that can be used to efficiently and inexpensively reach adolescents who belong to hidden and stigmatized groups, including transgender adolescents. In 4 months, we spent $1536 on advertisements and $500 on participant payment to recruit over 1200 cisgender adolescents and over 1500 transgender adolescents. The social media recruitment method was particularly effective with recruiting adolescents who were assigned female at birth (both cisgender and transgender). We found it more difficult to reach and recruit transgender and cisgender adolescents assigned male at birth using this study design. Our difficulty in recruiting transgender individuals assigned male at birth was not unexpected, given recent evidence of an altered sex ratio. Among transgender individuals, recent research has documented a higher proportion of adolescents assigned female at birth in both clinical and community samples (Aitken et al., 2015; Arnoldussen et al., 2019; Zucker, 2017, 2019), and our experiences indicate this is likely true among transgender adolescents using social media as well.

Limitations

There were several limitations of the recruitment and methodology for the GMY Study. As in other online surveys with youth (Thoma, 2017), attrition occurred across the survey. Thus, questionnaires that appeared later in the survey had lower numbers of participants. There is also the potential for participants to respond carelessly or randomly with online, anonymous surveys. In addition to the data quality procedures reported in the Method, participants responded to three questions from the Infrequency scale of the Minnesota Multiphasic Personality Inventory (MMPI; Arbisi & Ben-Porath, 1995). In subsequent articles, we will conduct sensitivity analyses to examine whether patterns of results change when analyses omit participants who were responding randomly or carelessly (identified from the MMPI) (Thoma, 2017). Additionally, Facebook and Instagram have powerful tools to accurately reach potential research participants based on demographic characteristics, but they do not currently provide a way to target specific subgroups of transgender individuals. For example, we were unable to accurately target transgender adolescents assigned male at birth through our ads without concurrently targeting transgender adolescents assigned female at birth. Our difficulty in recruiting transgender adolescents assigned male at birth may provide further indirect evidence for an altered sex ratio documented previously (Aitken et al., 2015; Zucker, 2017, 2019). However, we were still able to recruit enough transgender youth assigned male at birth for subgroup analyses by using a screening procedure to include only these adolescents at the end of our recruitment period. It is possible that our dataset would have decreased generalizability to the broader transgender adolescent population given our efforts to increase the number of transgender adolescents assigned male at birth in the sample. However, no nationally representative samples of transgender adolescents have been collected at the time of publication, and future nationally representative studies of adolescents in the U.S. should use comprehensive measures of both gender assigned at birth and current gender identity to accurately identify transgender youth. Lastly, future studies with greater funding should aim to compensate every participant to ensure that their contribution is appropriately incentivized (Puckett, Barr, Wadsworth, & Thai, 2018).

Implications and Future Directions

The GMY Study is the first nationwide study in the U.S. with the specific aim of examining mental and behavioral health disparities between transgender and cisgender adolescents, and between subgroups of gender minority youth. Social media recruitment and a waiver of parental permission were used to recruit large samples of transgender adolescents while maintaining the confidentiality and safety of these youth. What results is a large dataset with sufficient statistical power to examine mental and behavioral health disparities related to gender minority youth identity.

The results of our recruitment methods have important implications for future research on transgender youth. First, we believe our online advertisement-based recruitment methods can be used both for large within-group studies of transgender adolescents and for epidemiological research comparing transgender and cisgender adolescents with nationally representative studies. While our sample is large and diverse, it is not nationally representative of adolescents in the U.S. With greater levels of funding, we believe researchers could use these methods to collect nationally representative data from cisgender

and transgender adolescents. These methods avoid the drawbacks of the existing large-scale nationally representative studies, which are limited in the ability to collect nuanced data from sufficient numbers of gender minority youth. These methods also avoid the limitations of transgender-specific studies in which targeted, community-based recruitment may result in biased samples of youth who might be more likely than the general U.S. transgender adolescent population to have disclosed their gender identity to others, to have family support, and to have access to transgender resources.

The goal of this article was to introduce the GMY Study and to discuss the feasibility of using social media recruitment methods to recruit this sample. Future articles using the GMY Study will have several goals. First, we will descriptively examine youths' gender minority identities, to better understand the labels adolescents use to describe their gender. Second, we will examine mental and behavioral health disparities between cisgender and transgender adolescents across multiple domains, with attention to differences based on gender assigned at birth and specific gender minority identities (e.g., nonbinary vs. binary identities). Third, in examining disparities across and within subgroups of transgender adolescents, we will examine the unique trans-specific factors that may contribute to mental illness or resilience among transgender youth. Examining mechanisms of mental health disparities among transgender adolescents is imperative in shaping future intervention and prevention strategies for this vulnerable population.

Conclusions

In this article, we introduce the GMY Study and demonstrate the feasibility of recruiting large samples of transgender and cisgender adolescents through social media. The GMY study makes a unique contribution to this literature by examining youth aged 14–18 years; using comprehensive measures of gender identity to accurately identify transgender adolescents and examine rates of outcomes among subgroups of transgender adolescents, including a comparison group of cisgender adolescents to facilitate between-group designs examining disparities between groups; and including variables specific to transgender adolescent development to facilitate within-group examinations of psychosocial factors related to health within this population. The GMY study will facilitate accurate characterization of mental health disparities between transgender and cisgender adolescents, provide unique insights into differences across gender minority subgroups, and inform prevention and intervention strategies to improve transgender youth mental health.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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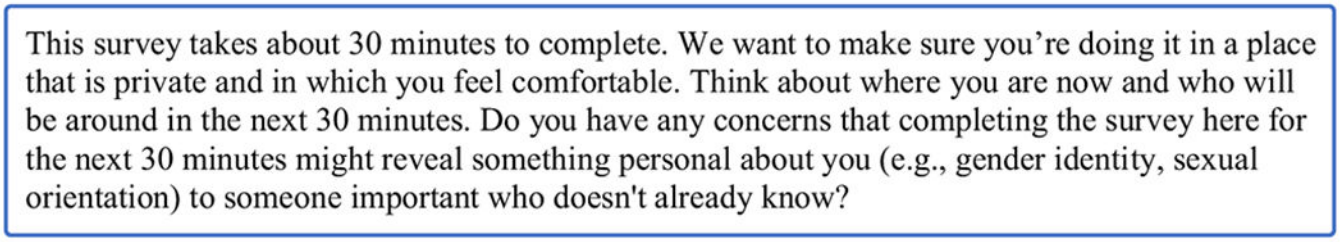

Fig. 1.

Safety message for participants before starting online survey. *Note*: If participants responded "Yes, I have concerns," they were re-directed to another screen that encouraged them to carefully consider whether they wanted to participate before starting the survey

Table 1

Demographic characteristics for total sample, cisgender adolescents, transgender adolescents, and gender identity subgroups

	Full Sample (*N* = 3318)		**All Cisgender (*n* = 1369)**		**All Transgender (*n* = 1938)**		**Cisgender female (*n* = 982)**		**Cisgender male (*n* = 387)**		**Transgender male (*n* = 986)**		**Transgender female (*n* = 132)**		**Nonbinary assigned female (*n* = 639)**		**Nonbinary assigned male (*n* = 84)**		**Questioning gender identity (*n* = 97)**	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Age	15.9	1.2	15.8	1.1	15.9	1.2	15.8	1.1	15.9	1.1	15.9	1.2	16.1	1.2	15.9	1.2	16.0	1.1	15.4	1.1
Subjective social status	5.6	1.6	6.0	1.6	5.4	1.5	6.0	1.5	6.0	1.7	5.4	1.5	4.9	1.5	5.6	1.6	5.4	1.4	5.2	1.3
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Race/ethnicity																				
White	2148	65	841	62	1298	67	604	62	237	62	674	68	81	61	432	68	54	64	57	59
Black	165	5	100	7	65	3	81	8	19	5	23	2	4	3	31	5	4	5	3	3
Hispanic	313	9	148	11	165	9	106	11	42	11	88	9	12	9	48	8	5	6	12	12
Asian/Pacific Islander	134	4	75	6	59	3	54	6	21	5	28	3	7	5	18	3	0	0	6	6
American Indian	41	1	13	1	28	1	10	1	3	1	9	1	5	4	11	2	1	1	2	2
Mixed	363	11	134	10	228	12	86	9	48	12	119	12	13	10	75	12	9	11	12	12
Black Mixed	122	4	49	4	72	4	37	4	12	3	39	4	2	2	22	3	5	6	4	4
Other	16	1	6	0	10	1	4	0	2	1	6	1	0	0	2	0	1	1	1	1
Missing	16	1	3	0	13	1	0	0	3	1	0	0	8	6	0	0	5	6	0	0
Educational status																				
High school	2794	84	1177	86	1608	83	861	88	316	82	840	85	98	74	519	81	64	76	87	90
College	245	7	90	7	155	8	63	6	27	7	75	8	10	8	62	10	6	7	2	2
Not in school	120	4	24	2	95	5	17	2	7	2	51	5	6	5	33	5	3	4	2	2
Missing	159	5	78	6	80	4	41	4	37	10	20	2	18	14	25	4	11	13	6	6
Sexual orientation																				
Straight/ Heterosexual	711	21	647	47	64	3	426	43	221	57	49	5	6	5	4	1	2	2	3	3
Gay/Lesbian	533	16	160	12	368	19	80	8	80	21	195	20	30	23	103	16	23	27	17	18
Bisexual/ Pansexual	1377	42	448	33	927	48	377	38	71	18	470	48	62	47	311	49	28	33	56	58

	Full Sample (*N* = 3318)		All Cisgender (*n* = 1369)		All Transgender (*n* = 1938)		Cisgender female (*n* = 982)		Cisgender male (*n* = 387)		Transgender male (*n* = 986)		Transgender female (*n* = 132)		Nonbinary assigned female (*n* = 639)		Nonbinary assigned male (*n* = 84)		Questioning gender identity (*n* = 97)	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Queer/Other	620	19	74	5	542	28	67	7	7	2	257	26	22	17	219	34	25	30	19	20
Questioning	23	1	11	1	12	1	9	1	2	1	7	1	1	1	2	0	0	0	2	2
Missing	54	2	29	2	25	1	23	2	6	2	8	1	11	8	0	0	6	7	0	0

Subjective social status was measured with the McArthur Scale of Subjective Social Status, a measure of adolescents' perceptions of their family's social status as compared with all other families in American society, visualized by a 10-rung ladder with higher scores indicating higher subjective social status (range 1–10; Goodman et al., 2001)